

1. On the Kangaroo called *Halmaturus luctuosus* by D'Albertis, and its Affinities. By A. H. GARROD, B.A., F.Z.S., Fellow of St. John's College, Cambridge. Prosector to the Society.

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(Plates VII.-IX.)

During the time that H.M.S. 'Basilisk' was cruising in the region of the south-east of New Guinea one of the sailors acquired a specimen of a small Kangaroo, which Signor L. M. D'Albertis, C.M.Z.S., obtained from him at Sydney. In a letter addressed to Mr. Sclater, dated Sydney, N. S. W., December 1, 1873, Signor D'Albertis described this specimen, under the name of *Halmaturus luctuosus*, as follows *:—"Length from the nose to the occiput $4\frac{1}{2}$ inches; length of the ears $1\frac{3}{4}$ inch; length of the thigh $5\frac{3}{4}$ inches; length of the tarsus, including the nail, $4\frac{3}{4}$ inches; length of the tail $11\frac{1}{2}$ inches. Total length, from the nose to the tip of the tail, 2 feet 5 inches. Its weight is $7\frac{1}{2}$ pounds.

"The fur is short, its general colour dark ashy brown with a silvery tinge, white at the roots; chin, throat, and chest white, with two horizontal ashy stripes under the pouch; on the top of the head a silvery whitish spot; the thighs more grey; feet dark, almost black; the arm white inside; the hand black. The tail moderately strong, of a similar colour to the body, but white and bare of hairs for about an inch at the extremity. The lips are barely covered with fur; the eyelids are puffed, almost naked, and provided with eyelashes so fine as not to be readily seen at first sight."

Hab. "S.E. of New Guinea."

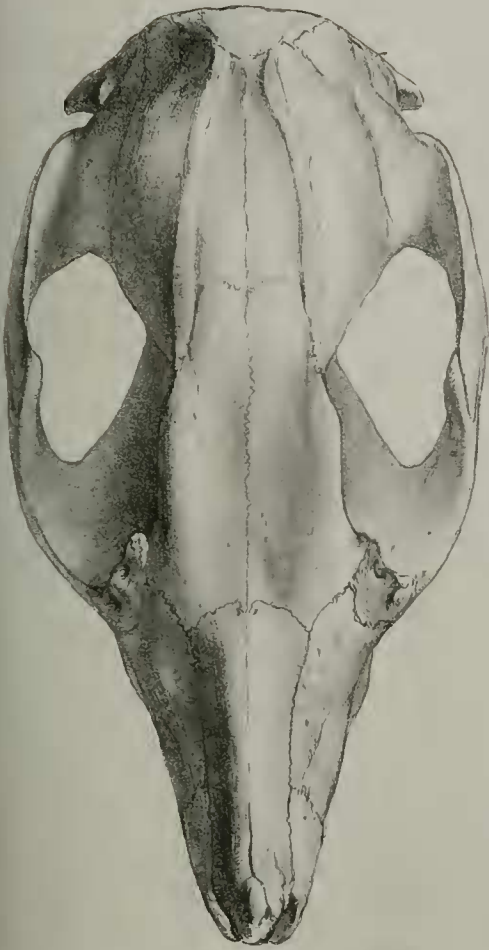
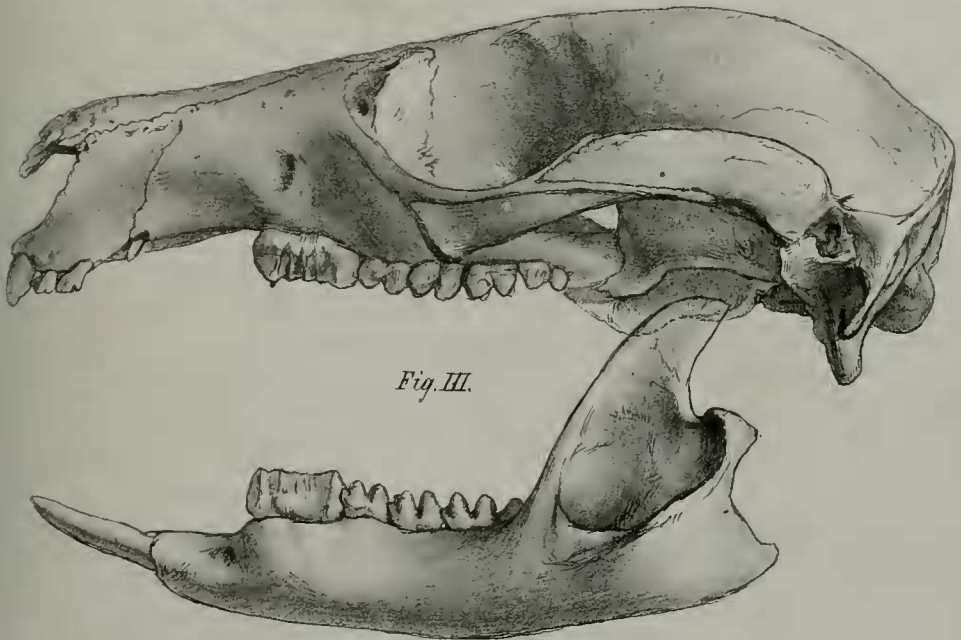
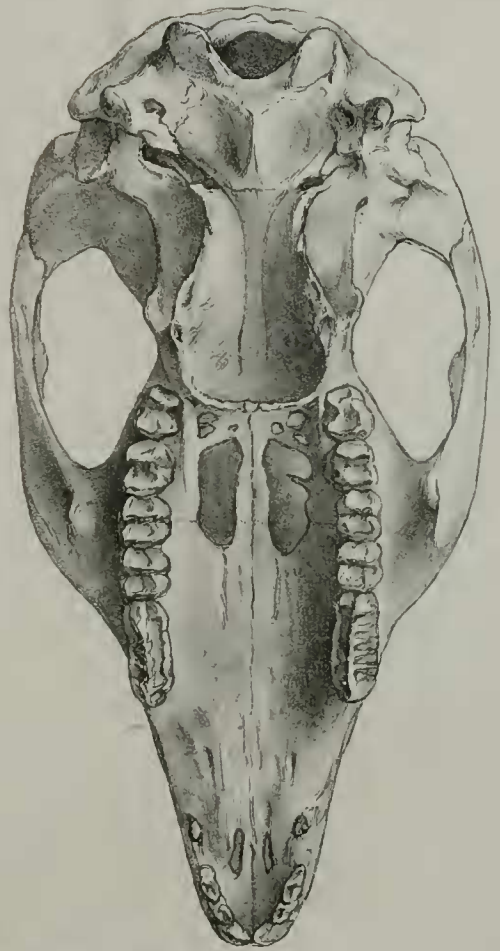
On April 17, 1874, this Kangaroo was deposited by Signor D'Albertis in the Society's Gardens; and at the Meeting for Scientific Business on May 5th following, Mr. Sclater, in reporting on the additions to the Society's Menagerie †, exhibited a drawing of it, and referred to it as "the typical example of *Halmaturus luctuosus* of D'Albertis." It is this specimen, a female, which forms the subject of the present communication. It died, Nov. 24, 1874, with congested lungs, after a severe frost, the first of the commencing winter.

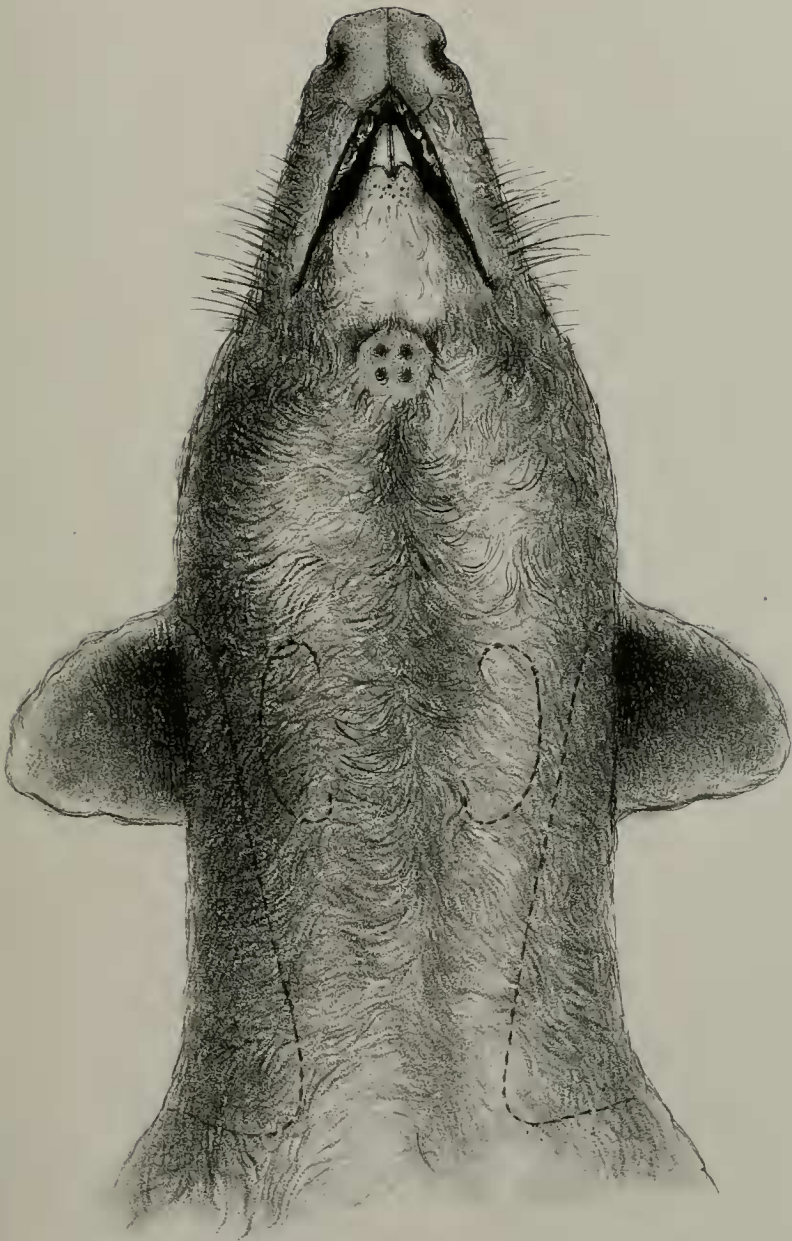
An examination of the dead body, and especially of the mouth, which it was impossible to observe in the living animal, made it evident that the species could not be rightly included in the genus *Macropus* or *Halmaturus*. Further comparison made it clear that it was intimately related to the genus *Dendrolagus*, and also to the species described in Waterhouse's 'Mammalia' ‡ as *Macropus brunii*.

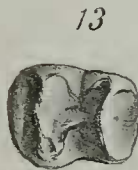
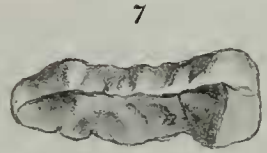
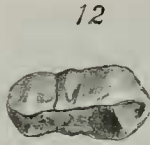
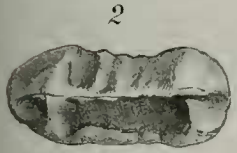
* P. Z. S. 1874, p. 110.

† P. Z. S. 1874, p. 247, pl. xlii.

‡ Vol. i. Marsupiala, p. 180.

Fig I.*Fig II.**Fig. III.*





Mr. Waterhouse bases his description of this last-named species on a skin so labelled in the British Museum, and on Müller's account of the same animal in his elaborate work*, in the letterpress of which it is termed *Dorcopsis brunii*. The priority of the generic name being undisputed, any fresh species which can be shown to be generically related to the above-determined species is evidently a species of the genus *Dorcopsis*.

This last remark is called for because the subject is rendered somewhat involved by an oversight of the illustrious Müller. In his description of his *Dorcopsis brunii* he evidently has no doubt that the specimen or specimens he is considering, is or are identical with the "Philander" described by Bruyn† as having been seen by him in the garden of the Governor of Batavia, upon which the name *brunii* was originally based. Prof. Schlegel‡, however, has most convincingly shown the unjustifiableness of this assumption, and has proved beyond a doubt that the species to which the name Philander can alone be applied is that found only in the islands of Aru and the Ké group, whilst the species which forms the subject of Müller's memoir is a denizen of New Guinea itself. Prof. Schlegel therefore retains the name *Macropus brunii* for the Philander of Aru, and of the New-Guinea animal forms the new species *Macropus muelleri*. As to me it is evident that *M. muelleri* is generically distinct from *Macropus* in its widest sense, and from all its minor divisions, it is also evident that *Dorcopsis muelleri* must be the name applied to the *Dorcopsis brunii* of Müller. The species which forms the subject of the present communication, belonging (as I hope to prove) to the same genus as *Dorcopsis muelleri* (Schlegel), must therefore stand as *Dorcopsis luctuosa* (D'Albertis).

The material at my disposal is the following:—the skin and skeleton of the type specimen of *Dorcopsis luctuosa*; the skins of an adult male and female, as well as of a young male, of *Dorcopsis muelleri* in the British Museum, collected by Mr. Wallace; a skull from the skin of the above-mentioned female of *Dorcopsis muelleri*; the much-discoloured skin of the male of the same species in the British Museum, from New Guinea, described by Mr. Waterhouse§ as *Macropus brunii*; two skeletons of *Dendrolagus inustus*, one in the British Museum and the other in the Museum of the College of Surgeons; as well as a pair of skins and an imperfect skull of *Macropus brunii* from Aru, kindly lent me by Mr. Edward Gerrard.

So far as I know, the visceral anatomy of *Dorcopsis muelleri* has not been described. That of *Dendrolagus inustus* is fully given by Prof. Owen in the 'Proceedings' of this Society ||; and some of the actual specimens on which this description is based are preserved in the Museum of the College of Surgeons. The internal anatomy of *Macropus brunii* is not known.

* Zoogdieren van den Indischen Archipel. pt. 4, pl. xxi.

† Reizen over Moskovie, p. 374, pl. 213 (1713).

‡ Nederlandsch Tijdschrift voor de Dierkunde, 1866, p. 350 *et seq.*

§ 'Mammalia,' vol. i. p. 180.

|| P. Z. S. 1852, p. 103 *et seq.*

The following Table gives the most important measurements of the skin of the female *Dorcopsis luctuosa*, compared with specimens of the same sex of *Dorcopsis muelleri* and *Macropus brunii*.

Lengths &c.	<i>Dorcopsis luctuosa</i> ♀.	<i>Dorcopsis muelleri</i> ♀.	<i>Macropus brunii</i> ♀.
	in.	in.	in.
From tip of nose to base of tail	24	20·25	21·0
Tail	13·25	15·4	11·75
From tip of nose to occiput	5·0	5·0	4·0
Fore limb	5·75	6·75	4·75
Hind limb.....	10·75	12·55	10·5
From heel to end of nail of fourth toe ...	4·75	4·75	5·0
Length of ear	1·4	1·25	1·75
Circumference of base of tail	4·25	2·0
From knee to knee over the back	14·0	17·0

The general contour of the body is quite Macropine; the breadth at the hips, however, is somewhat small. The hair is soft, short, and of a nearly uniform length all over the skin.

The head is elongate and conical, the muffle naked, the eyes large and antilopine. The colour of the upper surface and sides of the head* and back is uniformly blackish with a silvery gloss, each hair being whitish at its base for two fifths of its length, black for the next two fifths, and white at the tip. On the ventral surface a broad longitudinal white band extends from the line joining the angles of the mouth, backwards along the neck and belly as far as the pouch, behind and from the sides of which it continues towards the tail of a true slate-colour as far as the cloacal orifice, between which spot and the base of the tail it is again white. This white band occupies the whole of the region between the angles of the jaw, and continues down the neck over the abdomen of a slightly greater width. It only encroaches on the sides of the body by sending an expansion into each axilla, which is visible laterally just behind the elbow. There is no lateral transverse white stripe across the front of the thigh, like that so strongly marked in *M. brunii*; and, unlike this last named species, the light grey, nearly white stripe above and parallel to the lip is very insignificant, and does not extend backwards under the eye.

The ear is rounded, black inside and out, with a slight white line formed by the similarly coloured roots of the there exposed hairs bounding the auditory meatus anteriorly.

The non-exposed surfaces of both the arm proper and the thigh are of a pale grey. The other parts of both the fore and hind limbs are black. The nails of both the fore and hind limbs are short and Macropine.

* The silvery white spot on the top of the head, mentioned in D'Alberty's description, is not produced by the presence of white hair, but results from the fact that the spot where it is *sometimes* seen is the anterior junction of the forward-directed hair of the neck with the backward-directed hair of the frontal region. Its existence depends entirely on the way in which the hair is brushed; and it is not visible except after the natural disposition has been disturbed.

The peculiarity in the direction of the hair of the neck, which elsewhere occurs only in *Dorcopsis muelleri*, *Dendrolagus ursinus*, and *Dendrolagus inustus*, is as strongly marked as in those species—all the hair covering the space bounded in front by a line running transversely across the parietal region, and behind by two lines joining in the middle line between the shoulders to form a right angle seven inches behind the occiput, and extending forward and outward to the shoulder-joint, being directed forward, whilst the general body-covering of hair is directed normally backwards.

The lips are nearly naked, as is the skin covering the subsymphysial portion of the mandible, just behind which are four large and conspicuous glandular hair-follicles in the middle line, arranged in pairs to form a square (Plate VIII.). A collection of glands of a similar nature is found on the upper eyelid, situated a little nearer the inner than the outer canthus. These are well shown in Müller's drawing of *Dorcopsis muelleri**. A few long hairs are to be found on the sides of the upper lip.

The eyelids are somewhat puffed, almost naked, with the eyelashes scarcely apparent.

The tail is peculiar in being of considerable diameter to near its extremity, and in being uniformly thickly covered, for all but its termination, with soft, not very short, black hair. The skin of the distal end of the tail is black, except for its terminal $1\frac{1}{2}$ inch, where it is nearly white. On the upper part of this white portion there are a few white hairs; elsewhere it is naked and scaly. The scales are also distinctly seen extending forward for a short space over the inferior surface of the black skin, from the absence of hair in that part. The characteristic manner in which the animal employs its tail as a method of support (well shown in P. Z. S. 1874, pl. xlii.), might have almost been predicted from the above-described distribution of the hair; for it is evident that only a part at the extreme end could have habitually come into contact with the ground.

The only brown hair on the body is that in the pouch, which is rufous. There are four mammæ.

There is not the least difficulty in distinguishing *Dorcopsis luctuosa* from *D. muelleri*. The general colour of the head, back, and tail in the specimens of the latter species from Mysol, above referred to, is a mouse-chocolate, which becomes duller over the thighs, and of a pale grey on the outside of the fore limb. In *D. muelleri* the general white of the abdominal surface expands slightly opposite the orifice of the pouch, just above the knees; it, however, does not develop into a band over the flank as in *Macropus brunii*: the white of the throat also extends on to the angle of the jaw, and continues forward to join the dim white stripe along the upper lip; and there is a second insignificant white line under each eye, also (as mentioned by Prof. Schlegel) not nearly so marked as in *M. brunii*. In the male of *D. muelleri* the white tip to the tail is as much as three inches in length.

The skull of *Dorcopsis luctuosa* (Plate VII.) very closely resembles

* Loc. cit. pl. xxii.

that of *D. muelleri*, the following being the two most important measurements in adult specimens of the same sex (female):—

	<i>D. luctuosa</i> . in.	<i>D. muelleri</i> . in.
Length of skull	4·1	4·55
Greatest breadth, from zygoma to zygoma	2·2	2·05

In some minor details there are slight differences. In *D. muelleri*, as in most species of *Macropus*, the premaxillary region is bent downwards in such a way that the line formed by the trenchant edges of the molar teeth, if projected onwards to the nose, is quite above the incisor teeth. In *D. luctuosa* this bending downwards of the snout is not so marked, as will be seen by comparing the side view of the skull (Plate VII. fig. 3) and the similar one of *D. muelleri* in Prof. Müller's elaborate work above referred to.

The palatine foramina, one large one on each side, together with several much smaller ones behind each, in *D. muelleri* end behind the transverse palato-maxillary sutures, whilst in *D. luctuosa* their anterior margins are formed by the palatine plates of the maxillary bones, into which they encroach a short distance. In *D. luctuosa* the upper of the lacrymal foramina in each lacrymal bone has an ossific ridge behind it, which causes it to be completely exserted, or situated on the face outside the orbit; whilst in *D. muelleri* the absence of this bony ridge causes it to be situated in a recess on the margin of the orbit. In *D. luctuosa* the apex of the angular process which is developed downwards from the inferior margin of the maxillary portion of the zygoma, is opposite the anterior cusp of the third molar tooth, whilst in *D. muelleri* it corresponds to the posterior cusp of the second molar.

With regard to the teeth themselves, the canines in *D. muelleri* are quite the size of or even slightly larger than the most lateral incisor; in *D. luctuosa*, however, they are much smaller, being nothing more than slightly curved dentine cylinders about $\frac{1}{35}$ of an inch in diameter, as in the subgenus *Lagorchestes*, and directed downwards and forwards. In both the species the third incisor has an inflection on its labial surface, as in all the species of *Macropus*: in *D. muelleri* this fold is a little in front of the middle of the tooth; and in *D. luctuosa* it is decidedly nearer the posterior border. In the last-named species there is a similar distinct inflection on the second incisor; in *D. muelleri* this is not apparent. In *D. muelleri* the inferior incisor is directed more immediately forward than in *D. luctuosa*, in which it turns slightly upwards; this peculiarity is correlated with the difference in the obliquity of the premaxillary region (*vide* Plate IX.).

In the enormous premolars there is a slight difference—those of *D. muelleri* being a little the larger, in the upper jaw having a breadth of 0·55 inch against 0·475 inch for the same teeth in *D. luctuosa*. In *D. muelleri* the bony septum between the two fangs of each premolar, especially of the lower jaw, is particularly con-

spicuous in the undisturbed tooth, even projecting slightly beyond the osseous alveolar margin. In *D. luctuosa* this septum is scarcely visible.

The most important characters of the skull of *Dorcopsis*, as a genus, which distinguishes it from *Dendrolagus*, are the following:— In *Dendrolagus* the head is proportionally much shorter, the effect of which on the lower jaw is that, as the dental series is not correspondingly reduced, the ramus and the body of each lateral moiety meet at a right instead of an obtuse angle; there are no palatine foramina; the zygoma is considerably deeper; the exoccipital processes are longer, though not much so; the lower incisors are considerably broader, at the same time that the upper lateral incisors are larger and more cylindrical, with superficial grooves which can scarcely be termed inflections; the premolars are not so broad, and their outer posterior tubercles are more distinctly developed.

The molar teeth of *Dorcopsis* and *Dendrolagus* are almost identical (*vide* Plate IX.).

The cranial characters which distinguish *Dorcopsis*, as a genus, from *Macropus* are not very significant. Looking at the base of the skull the arrangement of the teeth deserves attention. In *Dorcopsis* the premolar with the molars on both sides form straight lines which are exactly parallel one to the other; whilst in *Macropus* the molar-premolar series form slight curves, convex outwards, converging behind as well as in front.

In *Dorcopsis* the zygomata are not so powerful or deep from above downwards as in the similar-sized species of *Macropus*. A peculiarity also presents itself in the lateral occipital region, the exoccipitals descending considerably below the free extremities of the paramastoids in *Macropus*, whilst in *Dorcopsis* they reach downwards scarcely any further distance.

Respecting the teeth, *Dorcopsis* differs from *Macropus* in the much diminished size of the superior lateral incisors. The central incisors are not so broad, but nearly as long. The second incisor is very much smaller; and though presenting a slight inflection in *D. luctuosa*, as mentioned above, this inflection is not, as in *Macropus*, posterior and internal, at the line of contact with the anterior margin of its more lateral neighbour. The third incisor is also very much smaller. The inflection on its labial or outer surface presents the same differences in the two species of *Dorcopsis* that are found in the various species of *Macropus*: in *D. luctuosa*, as in *M. brunii* and *M. thetidis*, it is very near its posterior border; whilst in *D. muelleri*, as in *M. major* and most of the other species, it is far forward.

The inferior incisors in *Dorcopsis* are proportionally narrower than in *Macropus*, in which peculiarity *Dendrolagus* resembles the latter genus; they, however, wear down in a similar manner, namely at the anterior end of the supero-lateral margin, differently from that in the Hypsiprymniform Macropodidæ, in which they wear in a rodent-like fashion.

The presence of the superior canines in *Dorcopsis* distinguishes it